

Claims:

1. A method for generating a surface printed with tags, the tags embedded with data, the method comprising the steps of:
 5. printing, using an encoder having two or more rendering engines, a pattern of tags, each tag having a data area comprising data dots and a locator component comprising constant dots;
 - using the tag encoder to obtain tag data from a tag format structure, the tag format structure being a dot based data package template containing a plurality of entries, there being an entry associated with each dot's position, an entry indicating whether a data dot or a constant dot,
 - 10 accordingly each entry having either fixed data bits or variable data bits, and further;
 - interpreting each entry independently without reliance on state information.
 2. The method of claim 1, wherein:
 - a first rendering engine processes one part of the surface and a second engine processes a
 - 15 different part of the surface.
 3. The method of claim 1, wherein:
 - a first rendering engine processes one part of a tag and a second engine processes a different
 - 20 part of the same tag.
 4. The method of claim 1, wherein:
 - each entry of the tag format structure comprises bits including a selected bit and the entry is interpreted as indicating a data bit, or not, according to the selected bit.
 - 25 5. The method of claim 4, further comprising the step of:
 - determining if the selected bit indicates that the entry is data, then interpreting a remainder of the entry as an address.
 6. The method of claim 1, wherein the tag format structure is comprised of one or more lines and
 - 30 further comprising the steps of:
 - scaling the tag by a factor of N, by scaling the number of entries in the tag format structure; and
 - scaling the tag format structure by replication of each entry N times and by replication of each line N times.
 - 35 7. The method of claim 1, further comprising the step of:
 - providing a tag format structure in which dot positions have a relationship and the relationship takes into account a redundancy encoding of the data.

8. The method of claim 1, further comprising the steps of:
using the tag encoder to redundantly encode the data bits to conserve bandwidth.
- 5 9. The method of claim 1, further comprising the step of:
redundantly encoding entries in the tag format structure.
10. The method of claim 1, further comprising the step of:
providing the encoder with an input which defines the structure of a tag.
- 10 11. The method of claim 1, further comprising the step of:
providing the encoder with an input which defines whether or not to redundantly encode the
variable data bits or to treat the variable data bits as having been encoded.
- 15 12. The method of claim 1, further comprising the step of:
providing the encoder with an input which defines whether or not to redundantly encode the
fixed data bits or to treat the fixed data bits as having been encoded.
- 20 13. The method of claim 1, further comprising the step of:
providing the encoder with an input comprising a number of variable data bit records, each
record containing one or more variable data bits for the one or more tags on a given line of tags.
- 25 14. The method of claim 1, further comprising the step of:
printed the tags with an infrared absorptive ink that can be read with a tag sensing device.
15. The method of claim 1, further comprising the step of:
using the encoder to merge encoded tag data with a basic tag structure and place dots in at
least one output FIFO in a correct order for subsequent printing.
- 30 16. The method of claim 1, further comprising the step of:
generating encoded tag data from original data bits on-the-fly to minimize buffer space.
17. The method of claim 1, further comprising the step of:
printing each tag so as to have a background pattern further comprising a locator component.
- 35 18. The method of claim 17, wherein:
the locator component is circular.

19. The method of claim 9, further comprising the step of:
performing the encoding using double indirection encoding.
- 5 20. The method of claim 1, further comprising the step of:
printing the dots as continuous tone dots.